MIDDLE ATLANTIC
Region 1
HHS-N-276-2011-00003-C
iRound: Bringing EBM to Family Centered Clinical Teaching Rounds
Alfred I duPont Hospital for Children of The Nemours Foundation
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01-DEC-2011-30-APR-2012
Special Funding Initiative: No
NN/LM Project Final Report
Report Submitted: 09-JUL-2012

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Executive Summary

Support of clinical decision making is a venerable goal of medical libraries. New technologies are now capable of supporting the skills of professional librarians in the clinical work areas of the physicians and nurses, including time spent on family-centered clinical teaching rounds. During rounds the entire medical team interacts with patients and their families; medical students, residents and nurses witness disease states and co-morbidities that may be unusual or new to them. These become teaching points and prior to this project, many attending physicians were accustomed to asking the librarian to utilize the iPad to pull a specific citation and share it with the rounding team, or would often ask the librarian to search the medical literature on the spot to see what articles support, or refute, an idea, diagnosis, treatment or patient outcome. Access to evidence based medicine (EBM) and evidence based nursing (EBN) at the point of care brought the medical librarian to clinical rounds. This project sought to push the objective further by, under the guidance of the librarian, placing an efficient, easy device into the hands of the clinicians to see how they could fare in searching to answer their own questions while interacting with one another and the electronic medical record (EMR).

During the course of the project attending physicians and senior residents each had access to iPads they maintained ownership of for the duration of their floor rotation. Some became quite adept and began to utilize the iBooks feature similar to the manner in which the librarian employs the app, to store and sort articles pertinent to current patients. Others preferred to operate the device mainly as a tool to view the EMR, check updated notes and vital signs, confirm the progress of any pending lab results, or to further acquaint themselves with a newly admitted patient that they have yet to see in-person. Attending physicians and residents also explored resources that may have been new to them as individuals, or to Nemours as a whole.

Success of the iPad deployment often hinged on the librarian's accessibility at the outset of a team's rotation, the more time spent with a team at the beginning, the more facile users became on their own and the more likely they were to utilize the device for the duration. The role of the librarian on rounding teams is now entrenched for several attending physicians and residents, strengthening the prospects for ongoing support of EBM and medical librarianship at Nemours.

Minority Populations Served

African Americans: No
American Indians/Alaska Natives: No
Asian Americans: No
Hispanics/Latinos: No
Native Hawaiians and Pacific Islanders: No
Other: No

Approaches and Interventions Used

This project had four major goals:
•Increase access to EBM and EBN electronic resources during clinical rounds.
•Enhance teaching points for clinical team.
•Improve patient outcomes and satisfaction.
•Optimize interactions with medical librarian and clinical teams during patient centered rounds.

The medical librarian attended rounds on a regular basis, spending time with each of the three resident teams as they rotated through the general pediatrics units. The residency office's commitment to the project provided tremendous support from the outset, as did the additional sponsorship received from the nurse managers of the three clinical units. The encouragement and promotion provided by the residency office and nursing is greatly appreciated as each area was concomitantly active with resident matching and submitting magnet documentation. Nurse managers and the residency office spoke of the project at daily huddles and team meetings before the launch of the project and relayed any follow up questions directly to the medical librarian at the outset and throughout the project itself.

Accomplishment of all four goals was soundly achieved for physicians, residents and medical students; nursing experienced technical issues that are discussed later in the submission. Each clinical team the librarian worked with gained greater understanding of the ability to create and research evidence based medicine questions, and how quickly that may be completed on a mobile device. Residents and medical students created their own accounts or downloaded apps available to them through the medical libraries of The Nemours Foundation while on rounds. Specific instances of the capabilities of the iPad in this project include utilization of:

•iTranslate app to communicate with an Arabic speaking parent
o App assisted the physician in relating with a parent and relaying that they would speak again with a translator
•VisualDx to compare "atypical mycobacterial infection" and "Bartonella henselae infection"
o Attending physicians able to show difference to residents and medical students as well as to patient family
•Multiple instances of searching PubMed, Ovid MD, MD Consult
o Evaluated and answered EBM questions in real-time
•Radiological images viewed through the EMR are clearer on iPad

Overall, utilization of the iPad increased the efficiency of senior residents as patient test results became quickly available and discharge orders were completed on the device during rounds instead of later in the day. The current technology, an assigned computer on wheels, provides these same options, however technological glitches and an often extremely limited battery life leaves them prone to abandonment partway through clinical teaching rounds. The extended life of the iPad and the librarian's ability to quickly trouble-shoot device errors increased utilization and team efficiency, providing the attending physician with more opportunities for teaching time.

Residents and medical students regularly request the librarian's presence during rounds to help them find information, especially when a complicated patient is on their service. These patrons often seek out the medical library and the librarian when they require searching assistance or are interested in becoming more adept searchers themselves. Since the start of the project nursing on all three units, as well as on the pediatric intensive care unit have requested the medical librarian be present at unit meetings.

Evaluation Activities

As this project had a technological foundation some troubleshooting was expected and occurred, unforeseen issues arose specifically with nursing. The four main objectives of the project were accomplished. Users are now more adept at creating clinical questions and finding information in the resources the medical library currently purchases. Clinicians are more aware of the role of the medical librarian and the services available during clinical rounds.

We were unable to fully accomplish our objectives in regards to nursing and EBN. Current access configurations prevented the majority of nursing staff from access the EMR through the iPad. This unexpected issue may leave us with pathways for future projects and research.

Problems or Barriers Encountered

The medical librarian experienced interest in the iPad and its applicability from all staff, but some attending physicians felt that it interfered with their teaching styles and a few senior residents preferred to not deviate from the current technology (computer on wheels) so late in their program. The librarian also received feedback regarding concerns over disinfecting the iPad between patient rooms and the portability and practicality of toting the device on rounds lasting up to three to three-and-a-half hours. Many residents simply placed the iPad on top of the computer on wheels and pushed the entire apparatus from room to room. The entire facility is Wi-Fi enabled, however some areas have better coverage than others and intermittent outages were experienced, most often when moving between units or floors. All areas noted to have low Wi-Fi coverage were shared with IT and are being addressed on a case-by-case basis. Concerns over the iPads physical security were managed by designating "ownership" to an individual for each of the rotations.

Full utilization of the capabilities of the iPad is not available to the entirety of our nursing staff. Access to the EMR is available on the iPad through the Citrix app. The nature of the secure server is dependent upon users having "off site" access, due to fiscal reasons this is not currently feasible for the majority of our nursing staff. Thus, nurses had access to the librarian and all of our clinical-decision support resources on the iPad, but not to the EMR itself. Although unfortunate for this project, pathways exist for future research.

Continuation Plans

The medical librarian continues to round with the three general pediatrics teams. Each team will maintain ownership of one iPad to utilize as they deem necessary. It is anticipated that residents will continue to explore the device's EBM and EMR capabilities. Those that are preparing for their second and third years of residency at Nemours now expect and anticipate the medical librarian's participation on rounds and are growing in their abilities to form thoughtful clinical questions. Plans are also in development to expand this project to the pediatric intensive care unit.

The popularity of the attendance of the medical librarian preceded the project and we are currently in the process of adding an additional professional medical librarian to our staff. The expectations are that an added information professional will provide us with more time and opportunity to focus on our nursing staff, with the possibility of re-imagining this project with an EBN spotlight. No further funding is expected at this time, as this process will emphasize the electronic resources and databases currently available.

Impact

Rounding with clinical teams and providing decision support tools to physicians, residents, medical students and nurses fosters learning, the foundation of The Nemours Foundation strategy map. Every patient and family has something to teach families, and the constant publishing cycle forever brings new information and knowledge from the bench to the bedside where it is needed most. It is in this arena that the skills and abilities of a technology driven and equipped medical librarian becomes a member of the clinical team. Family-centered patient care is a cornerstone of our organizational strategy, and partnering with care teams to achieve superior patient satisfaction and quality outcomes places the medical librarian in a position to further promote the utilization of evidence based medicine across the spectrum of clinical care. The iPad empowers residents and attending physicians to view aspects of a patient's chart in real-time, to ask and clarify questions, and to interact with family members with the benefit of the most current information about the child and care options.

Utilization of mobile devices, specifically the iPad, allows users a variety of new pathways with which to connect with patients and families. On clinical teaching rounds we experienced a situation in which a family spoke no English and we had no available translators to speak with them in their native tongue, although one was being sought. The iTranslate app allowed the attending physician to tell the present parent that a translator was coming to help and that the physician would return; the parent replied via the iPad that she understood and thanking him for his time and help.

Mobile technology is routinely employed on rounds to validate basic medical date, growth charts are referenced, drug information and unit conversions are all consistently verified on personal mobile devices. Bringing an iPad packed with EBM databases changes how these resources are thought of and accessed. The majorities of clinicians come to rounds familiar with one or two databases, but usually leave with the awareness of several more. The medical librarian fills in knowledge gaps and raises understanding through utilization, answering questions on everything from the half-life of a certain benzodiazepine, when babies develop a sense of taste and to what, the incidence of concurrent serious bacterial infection with enterovirus, to the sequelae for Pasturella meningitis in a neonate. The quick and efficient answering of clinical questions most effectively demonstrates the project's impact. Ruling out differential diagnoses occurred regularly, as did verification of treatment plans and goals. Medical students and residents increased their ability to create and ask strong clinical questions, allowing for better research, more focused teaching, and improved patient care.

The final goals of this project include publication of an article on integration of medical librarians into clinical rounds via mobile technology. Additionally we hope to present a poster on this project at the MLA 2012 Quad Chapter Meeting.

Lessons Learned

The success of this project is due in part with established relationships between the medical librarian and the spectrum of clinicians involved. Prior to the project the medical librarian spent significant time on two of the three units and had built trust in the ability to perform quick and accurate searches during clinical teaching rounds. The presence of the medical librarian at the beginning of the clinical week set the tone for the rest of the rotation. If the librarian was not present on the first or second day of the week, and with three teams on rotation it was not possible to meet with all three within the first two days, although the librarian's expertise and abilities were still welcome to join the iPad was often abandoned for the traditional computer on wheels.

Encroachment upon teaching style often became a factor in utilization of the device, as physicians that engage in didactic teaching felt the iPad was an imposition. These attending physicians and senior residents appreciated the efficiency of the device and how facile the librarian could be in finding articles and answering clinical questions; they rejected committing to the process themselves citing clumsiness of carrying it for the duration of rounds or concerns over sanitizing the iPad. Possible infectious issues concerning the iPad are legitimate and were not fully addressed, other than a refrain from touching the device during patient encounters.

The entire facility is Wi-Fi enabled, however some areas have better coverage than others and intermittent outages were experienced, most often when moving between units or floors. All areas noted to have low Wi-Fi coverage were shared with IT and are being addressed on a case-by-case basis. Concerns over the iPads physical security were managed by designating "ownership" to an individual for each of the rotations.

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It was anticipated that the iPad would have a positive impact on health literacy and patient education, yet the outcomes exceeded expectations. The iPad was utilized numerous times to show parents rashes in different stages and what to expect next, often calming concerned families. Clinicians also used it to point patients and parents in the direction of sites such as MedlinePlus, PubMed Health and CDC.gov and KidsHealth.org, a medical information website created and maintained by The Nemours Foundation for children from birth through adolescence. Residents understood that these sites are available, but this project aided in showing how quickly the resources could be accessed and shared with patients and families.

Other

n/a

Attachment 1: AR summary data: Subcontractor activities